A Statistical Analysis of Mental Health and Social Justice

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MSCS 396: Just Data

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18 May 2018

Introduction

As defined by the World Health Organization, mental health is a state of well-being in which every individual realizes their own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to their community. When considering a mental health illness, there is a disconnect between the research, which is disease and pathology focused, and society's views, which are often centered around stigma and viewing illness as a "faulty" brain. This implies a separation of the brain and the body, and delegitimizes the external experiences of the individual and how they may impact their mental health. This disconnect results in more research and funding sent towards the genetic and biological study of mental illness, with less resources allocated towards studying the environmental impacts of mental health. It also puts less emphasis on how one's mental health impacts their experience in society.

Mental illness affects millions of people worldwide and Chris Summerville gave a Ted Talk in 2015 addressing this issue titled 'Justice Delayed is Justice Denied'. Summerville discusses how mental illness is so pervasive in our society that everyone knows at least one or more other people who are affected in some way. He goes on to reveal his personal connection as he and all six of his siblings dealt with mental illness in some way, from bipolar disorder to schizophrenia to depression to suicide, it was a huge part of his daily life though rarely talked about. This led him to pursuing a career in improving the lives of those affected by various mental health disorders and he is now the CEO of the Schizophrenia Society and the Executive Director of the Manitoba Schizophrenia Society where his aim is to enhance and improve the lives of those who are affected by mental illness so that those enduring a mental illness feel and

experience the full privileges of citizenship and social inclusion. Our research will hopefully shed more light on areas where this is not the case, where individuals experiencing mental illness are not experiencing the full privileges of citizenship and social inclusion, and bring us closer to a solution.

There is a lot of existing research in the field of mental health and how it is associated with various demographics, or how it relates to career or healthcare, however the aim of our research is to synthesize these subjects and simultaneously analyze the bidirectional correlations between mental health, demographics, healthcare, and career. Williams et al. (1997) found that there were significant differences in mental health between black individuals and white individuals, however this difference was significantly reduced when adjusted for education and especially income. Additionally, according to Gary (2005), ethnic minority groups, who already confront prejudice and discrimination because of their group affiliation, suffer double stigma when faced with the burdens of mental illness and the combination of stigma and membership in an ethnic minority group can impede treatment and well-being, creating preventable and treatable mortalities and morbidities. Finally, according to the World Health Organization (WHO), a negative working environment can lead to physical and mental health problems but there are many effective actions that organizations can take to promote mental health in the workplace.

Our Findings

In order to simultaneously analyze the bidirectional correlations between mental health, demographics, healthcare, and career, we analyzed microdata through Structural Equation

Modeling (SEM). We collected our data from the IPUMS Health Survey, which contains data from the National Health Interview Survey (NHIS). The NHIS is a survey collecting information on the health, health care access, and health behaviors of the civilian, non-institutionalized U.S. population, with digital data files available from 1963 to present. We selected measured variables that would allow us to analyze associations between mental health, healthcare, career identity, and a variety of demographic factors through the creation of latent variables. Latent variables are not directly observed but are rather inferred or created using measured variables that are directly observed. We used various measured variables from IPUMS to create three latent variables: mental health, career, and healthcare. Our goal was to use a variety of the selected IPUMS variables that collectively come together to represent a latent variable of interest. All of our data manipulation and analyses were done using R, a statistical computing and graphics software.

      We used structural equation modeling (SEM) to identify the relationships between career, healthcare, and mental health (latent variables) as well as with observed IPUMS demographic variables. SEM creates these latent variables using input from multiple measured variables. This modeling allows for the simultaneous analysis of a set of relationships between various independent and dependent variables. We hypothesize that there would be significant associations between mental health and both career and healthcare and that there also may be associations between race and mental health as well as sex and mental health. Below is our hypothesized map of associations between variables with latent variables being circles and observed variables being rectangles:
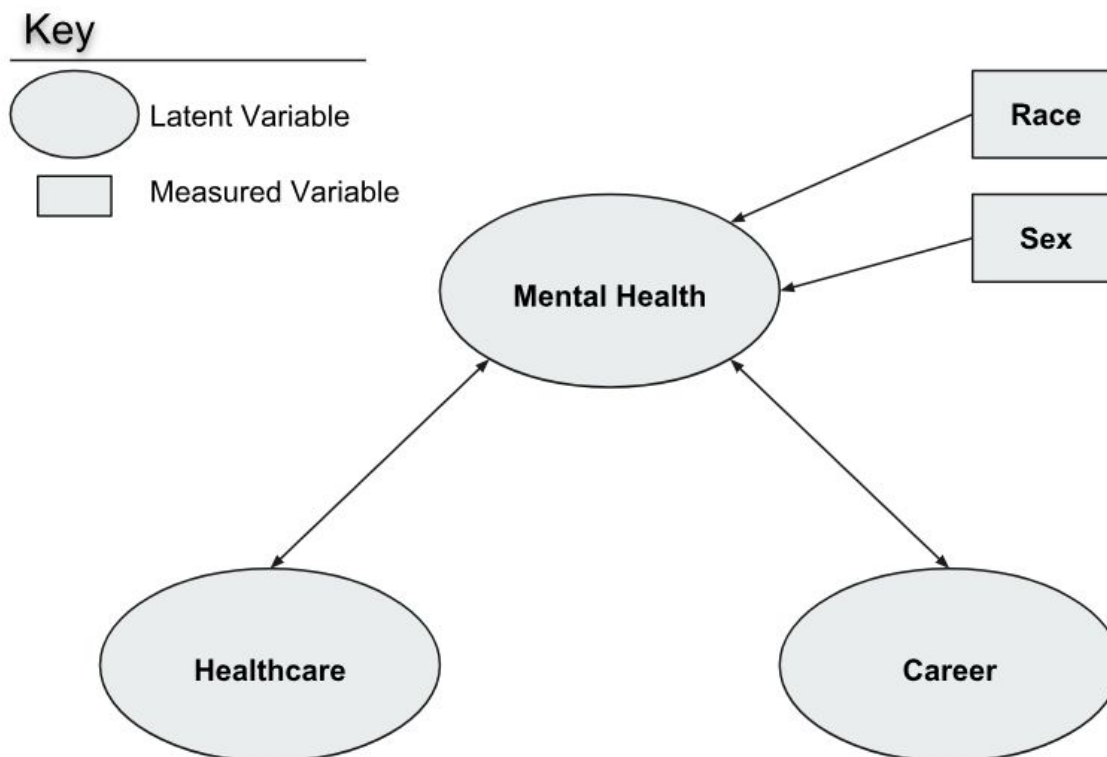
Fig 1. Hypothesized map of associations between demographics, healthcare, career, and mental health

We performed three different SEM analyses in order to study our hypothesized relationships. Our first model allows us to examine the relationships between mental health and career and healthcare. We see that there is a significant relationship between mental health and career (std.all = 0.433, p-value = 0.000). This value tells us that according to our model a better ability score for career is associated with a worse ability score for mental health. There is also a significant relationship between mental health and healthcare (std.all = 0.257, p-value = 0.000). This value indicates that, according to our model, a better ability score for healthcare is

correlated with a better ability score for mental health, and a lower ability score for healthcare is correlated with a worse ability score for mental health. This model is shown below:
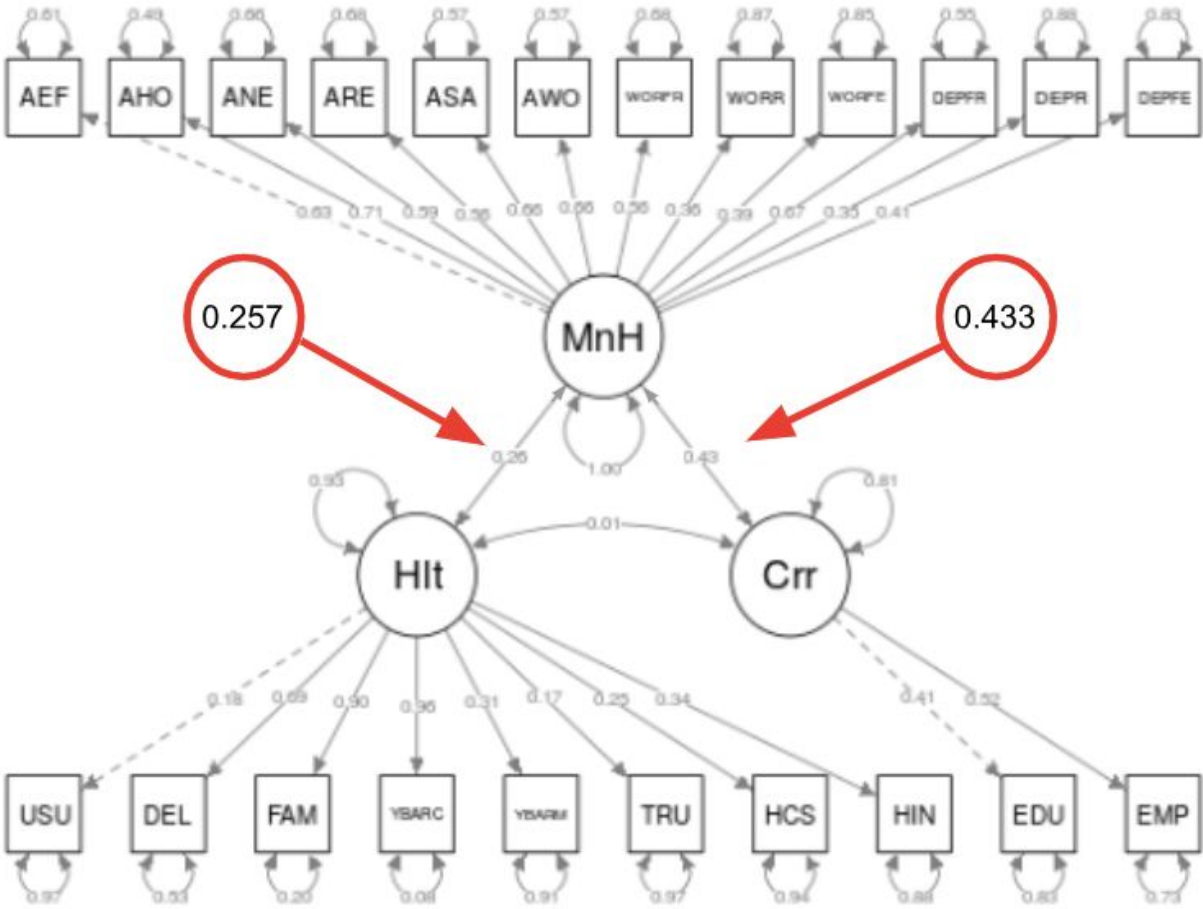

**Fig 2.** First model with associations between mental health, healthcare, and career

Our second model focused on the association between mental health and sex. We wanted to analyze whether or not mental health differs by gender. This model indicates that sex has a significant association with mental health (std.all = 0.041, p-value = 0.000) and indicates that males, overall, have better mental health when compared to females.
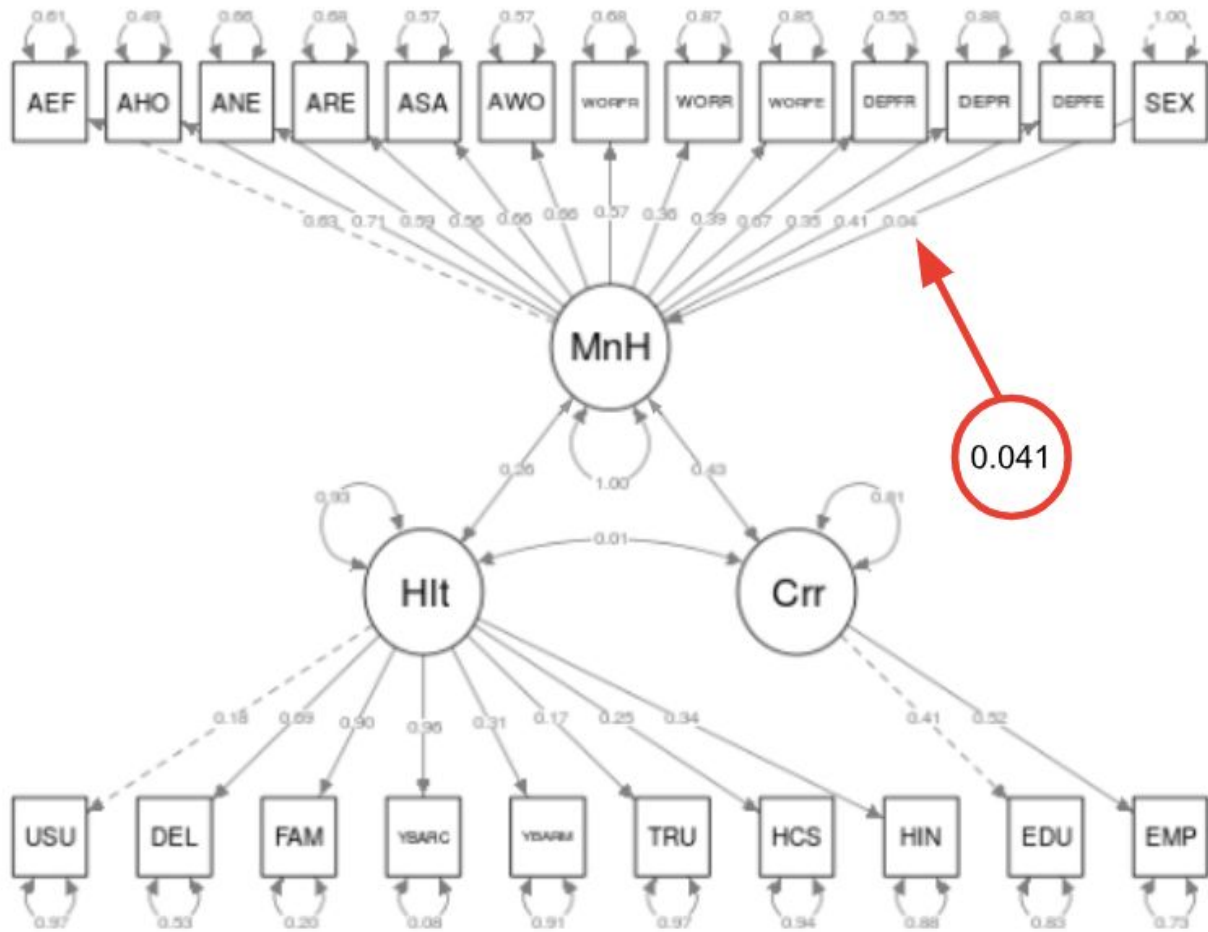
Fig 3. Second model adding sex demographic to general model

Finally, our last model focuses specifically on the relationship between race and mental health. We wanted to analyze whether or not mental health differs between race groups. Our results indicate that there is a significant association between race and mental health (std.all = -0.037, p-value = 0.000). This significant coefficient tells us that, according to our model, individuals who are black have a lower mental health score than individuals who are white. A lower mental health score indicates worse mental health.
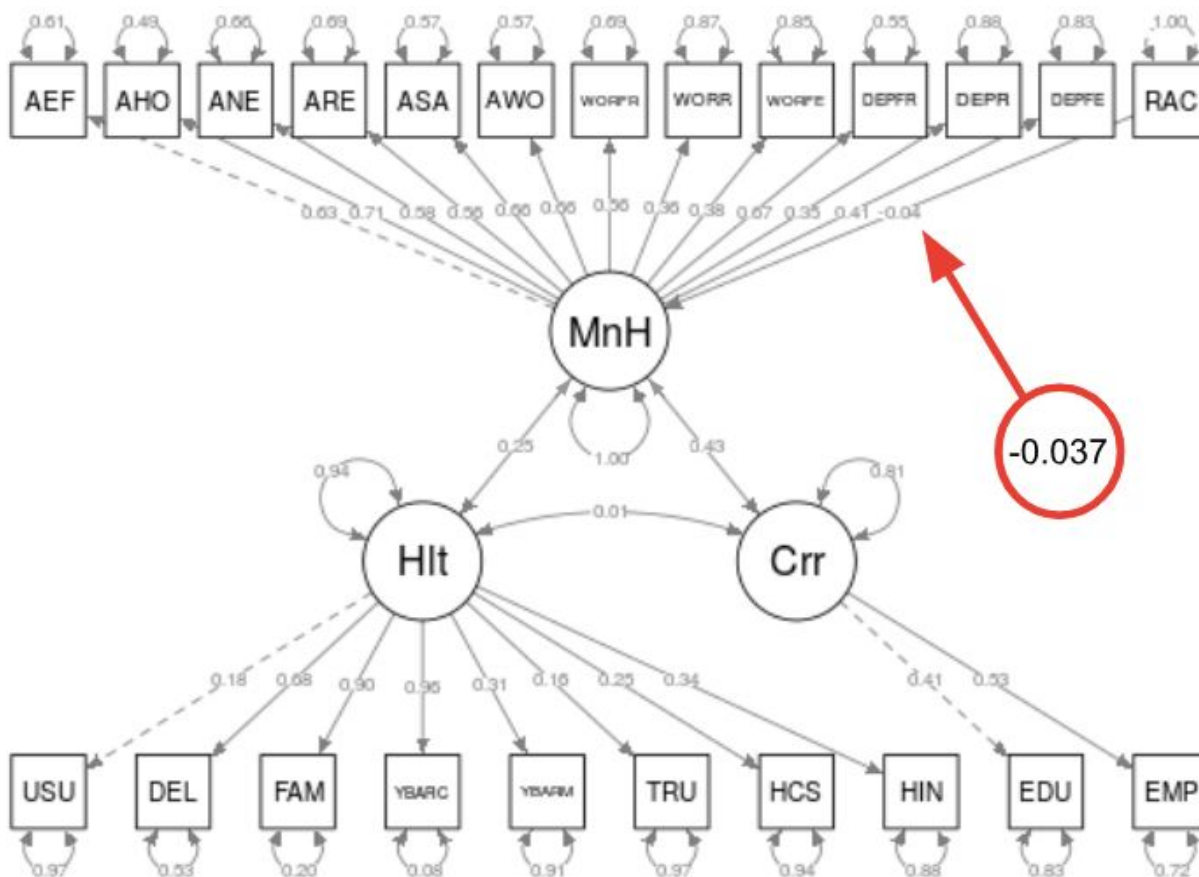
Fig 4. Third model adding race demographic to general model

Why is this important?

Our findings from this research demonstrate a clear injustice with respect to mental health, specifically regarding healthcare, work, race, and sex. Often mental illness is viewed as something that can be blamed on the individual, however in reality this is not at all accurate. Our results support our hypothesis that there are significant relationships between mental health and healthcare, career, sex, and race, which suggests that these factors either impact or are impacted by mental health even though they are not all able to be controlled by the individual. Societally,

there is a negative stigma associated with mental illness which can lead to additional secondary negative consequences for individuals struggling with mental illness.

In our research, we found a positive association between mental health and healthcare, indicating that better mental health is associated with better healthcare and worse mental health is associated with worse healthcare. This could be because of multiple reasons. First of all, individuals with worse mental health are more likely to be attempting to access mental health treatment and other services, however mental healthcare services are, on average, harder to access and of lower quality than general healthcare services (Melek et al. 2017). The Mental Health Parity and Addiction Equity Act of 2008 was passed to make mental health and substance abuse treatment just as easy to get as care for any other condition, however there are still disparities existing today in terms of quality and access to care between mental and physical healthcare. This could be one possibility for the positive association between mental health and healthcare.

Additionally, our research shows a positive association between mental health and career, meaning that a lower mental health score is associated with a lower career score and our career latent variable is measured by level of education and employment status. Employment status has been shown to be correlated with mental health, but it is difficult to disentangle whether mental illness causes unemployment or unemployment causes mental illness. Olesen et al. (2013) conducted a study to address this question and they found that mental health was shown to be both a consequence of and risk factor for unemployment; poorer mental health observed amongst people who are not working is attributable to both the impact of unemployment and existing mental health problems. This is a destructive cycle because mental health affects future

employment, but job loss affects mental health. This promotes social exclusion and inequality and in order to combat this injustice, there must be responses to address both sides of the problem.

Looking into the relationship between sex and mental health, we found that males are more likely to have a better mental health score and females are more likely to have a worse mental health score. A lot of research has been conducted on this topic and there are many factors, especially environmental, that contribute to this disparity. First of all, women are typically taught to internalize an observer's perspective as a primary view of their physical selves which has many negative consequences including increased shame and anxiety and reduced awareness of internal bodily states (Fredrickson and Roberts 1997). Additionally, women are more likely to feel a lack of autonomy and control over their life, which has been shown to be significantly associated with depression, due to social constructions of gender roles (World Health Organization 2002). On the other hand, men are often socialized and raised not to express their emotions and are more likely to have problems with emotional regulation which can lead to an increased likelihood of developing mental illness, especially mood disorders, but a decreased probability that they would seek treatment or disclose their feelings (Gross and Muñoz 1995). This culturally learned internalization contributes to an under diagnosis of mental health problems in males. These are some of the biggest researched factors that could contribute to explaining the disparity in measured mental health between males and females.

The final variable we looked at with respect to mental health was race. Due to limitations on our dataset, we were only able to look at individuals who self-reported as either white or black which will limit our interpretations and therefore does not show a complete picture of the

relationship between race and mental health although we can still draw meaningful conclusions from our results. Our results show that individuals who self-identify as black are associated with a lower mental health score than individuals who self-identify as white. These results do not imply that black individuals have an inherently worse mental health, rather they shed light on the existence of systematic inequalities that contribute to disproportionate risk of developing mental illness for individuals of ethnic minorities. Brown et al. (2000) found a significant association between racial discrimination and mental health. The experience of racial discrimination can be stressful and reduce a person's sense of control and meaning while evoking feelings of loss, ambiguity, strain, frustration, and injustice (Bowser 1981). Additionally, ethnic minority groups, who already confront prejudice and discrimination because of their group affiliation, suffer double stigma when faced with the burdens of mental illness (Gary 2005). These systematically unjust and environmental factors must be taken into account when looking at results relating to race and mental health in order to fully understand the underlying mechanisms and injustices.

Plan of Action

It is apparent that improvements can and should be made in the United States mental health care system to better find and treat individuals suffering from mental health issues. The Substance Abuse and Mental Health Services Administration (SAMHSA) outlines a clear five step plan for improving mental health nationwide (Hyde 2015). Their plan includes the following steps:

1. Increase prevention, treatment, and recovery services
2. Expand the mental health workforce

3. Widen the use of health information technology

4. Educate the public

5. Invest in research

A significant obstacle to the first step of providing sufficient care is funding; costly services like inpatient care are often not feasible for either the government to fund on a large scale or individuals to afford. This is why the World Health Organization has recommended introducing a mixture of local efforts with the more expensive and intensive resources (World Health Organization 2014). By developing community-level mental health services or integrating these services into general care, a larger portion of the population would have access to diagnoses and treatment options. Outreach in communities should also keep in mind the disparities that exist. Those who are at a higher risk in terms of sex, race, and other demographics should have access to educational tools and ways to manage mental illness.

The second step of the plan highlights another important issue. There are simply not enough mental health professionals for the size of the population. According to the Kaiser Family Foundation ("Mental Health Shortage" 2018), only 32.52% of the need for mental health services is being met at a national level, given the current number of professionals available. Again, broadening general health practitioners' knowledge of mental health issues and treatments and integrating mental health care into general care could ameliorate this issue. By increasing the availability of mental health care on a local level, more people will be able to manage their mental health instead of suffering without any treatment options.

The third and fourth steps provide a relatively easy method of improving mental health. Education could come from more availability of online resources, either from their own doctor's

or hospital's website or general health sites. Giving people the tools to learn about their own mental health and ways to seek help would allow more people to understand what exactly mental health is and how they or a loved one might be affected by a mental health issue. This would also help combat the stigma surrounding the topic; if more people know about common illnesses, it may seem less embarrassing for people who need help to seek it.

Finally, there needs to be an effort to fund and produce more research. Of course, mental health research is challenging because it must incorporate brain chemistry, social and economic factors, and genetics. According to the Medical Research Council (2010), "the scale of mental health research – measured though the scale of annual public and charitable funding – is low relative to the burden of disease". More data including less common disorders or minorities would shed more light on mental health illnesses. With more participants and more funding, great gains in mental health research could generate novel ideas or treatment options that could significantly improve the lives of people affected by mental health issues.

References

Bowser, Benjamin P. 1981. "Racism and Mental Illness: An Exploration of the Racist's Illness and the Victim's Health." Pp.107–113 in *Institutional Racism and Community Competence,* Chapter 11, DHHS Publ. No. (ADM) 81–907

Brown, T. N., Williams, D. R., Jackson, J. S., Neighbors, H. W., Torres, M., Sellers, S., & Brown, K. T. (2000). "Being black and feeling blue": The mental health consequences of racial discrimination. *Race and Society*, 2(2), 117-131. doi:10.1016/S1090-9524(00)00010-3

Fredrickson, B. L., & Roberts, T. (1997). Objectification Theory: Toward Understanding Womens Lived Experiences and Mental Health Risks. *Psychology of Women Quarterly,21*(2), 173-206. doi:10.1111/j.1471-6402.1997.tb00108.x

Gary, F. A. (2005). "STIGMA: BARRIER TO MENTAL HEALTH CARE AMONG ETHNIC MINORITIES." Issues in Mental Health Nursing *26*(10): 979-999.

Gross, J. J. and Muñoz, R. F. (1995), Emotion Regulation and Mental Health. *Clinical Psychology: Science and Practice*, 2: 151-164. doi:10.1111/j.1468-2850.1995.tb00036.x

Hyde, Pamela S. "Five Point Plan to Improve the Nation's Mental Health." *SAMHSA*, 18 Feb. 2015, https://blog.samhsa.gov/2015/02/18/five-point-plan-to-improve-the-nations-mental-health/#.Wvndn4jwY2w

"Improving Mental Health Care." *Unite for Sight,* www.uniteforsight.org/mental-health/module9.

Melek, S., Perlman, D., & Davenport, S. (2017, December). "Addiction and mental health vs. physical health: Analyzing disparities in network use and provider reimbursement rates." *Mental Health Treatment and Research Institute*.

"Mental Health Care Health Professional Shortage Areas (HPSAs)." *The Henry J. Kaiser Family Foundation,* 3. Apr. 2018, https://www.kff.org/other/state-indicator/mental-health-care-health-professional-shortage-areas-hpsas/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

Olesen, S. C., Butterworth, P., Leach, L. S., Kelaher, M., & Pirkis, J. (2013). Mental health affects future employment as job loss affects mental health: Findings from a longitudinal population study. BMC Psychiatry, 13, 9. doi:http://dx.doi.org/10.1186/1471-244X-13-144

"Review of Mental Health Research: Report of the Strategic Review Group 2010". *The Medical Research Council,* May 2010, https://mrc.ukri.org/documents/pdf/mrc-mental-health-research-report-2010/.

Summerville, C. (2015, January). Chris Summerville: Justice delayed is justice denied [Video file]. Retrieved from https://www.youtube.com/watch?v=eIA-__uOD-8

Williams, D. R., et al. (1997). "Racial Differences in Physical and Mental Health: Socio-economic Status, Stress and Discrimination." J Health Psychol *2*(3): 335-351.

World Health Organization (2002). "Gender and Mental Health." Accessed 08 April 2018. http://apps.who.int/iris/bitstream/handle/10665/68884/a85573.pdf;jsessionid=CA8F4D04 95502AAA87FD51C8C10FC1F6?sequence=1.

World Health Organization (2014, August). "Mental Health: A State of Well-Being." World Health Organization. URL http://www.who.int/features/factfiles/mental_health/en/. Accessed 10 May 2018.

World Health Organization (2017). "Mental Health in the Workplace." Accessed 3/11/2018. http://www.who.int/mental_health/in_the_workplace/en/.

Yves Rosseel (2012). lavaan: An R Package for Structural Equation Modeling. Journal of Statistical Software, *48*(2), 1-36. URL http://www.jstatsoft.org/v48/i02/.

APPENDIX: LIST OF OBSERVED VARIABLES

Table 1. List of observed variables used to create mental health proxy variable

Cryptic Variable	Survey Question	Original Code	Indicator Recode
AEFFORT	During the past 30 days, how often did you feel that everything was an effort?	0 - None of the time 1 - A little of the time 2 - Some of the time 3 - Most of the time 4- All of the time 6 - NIU 7 - Unknown-refused 8- Unknown-not ascertained 9- Unknown-don't know	0 = 2, 3, 4 1 = 0,1 Removed = 6,7,8,9
AHOPELESS	During the past 30 days, how often did you feel hopeless?	0 - None of the time 1 - A little of the time 2 - Some of the time 3 - Most of the time 4 - All of the time 6 - NIU 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 2,3,4 1 = 0,1 Removed = 6,7,8,9
ANERVOUS	During the past 30 days, how often did you feel nervous?	0 - None of the time 1 - A little of the time 2 - Some of the time 3 - Most of the time 4 - All of the time 6 - NIU 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 2,3,4 1 = 0,1 Removed = 6,7,8,9
ARESTLESS	During the past 30 days, how often did you feel restless or fidgety?	0 - None of the time 1 - A little of the time 2 - Some of the time 3 - Most of the time 4 - All of the time 6 - NIU 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 2,3,4 1 = 0,1 Removed = 6,7,8,9

ASAD	During the past 30 days, how often did you feel so sad that nothing could cheer you up?	0 - None of the time 1 - A little of the time 2 - Some of the time 3 - Most of the time 4 - All of the time 6 - NIU 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 2,3,4 1 = 0,1 Removed = 6,7,8,9
AWORTHLESS	During the past 30 days, how often did you feel worthless?	0 - None of the time 1 - A little of the time 2 - Some of the time 3 - Most of the time 4 - All of the time 6 - NIU 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 2,3,4 1 = 0,1 Removed = 6,7,8,9
WORFREQ	How often do you feel worried, nervous or anxious?	0 - NIU 1 - Daily 2 - Weekly 3 - Monthly 4 - A few times a year 5 - Never 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 1,2 1 = 3,4,5 Removed = 0,7,8,9
WORRX	Respondents reported whether they took medication for feelings of worry, nervousness, or anxiety.	0 - NIU 1 - No 2 - Yes 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 2 1 = 1 Removed = 0,7,8,9
WORFEELEVL	Thinking about the last time you felt worried, nervous or anxious, how would you describe the level of these feelings?	0 - NIU 1 - A lot 2 - A little 3 - Somewhere between a little and a lot 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 1,3 1 = 2 Removed = 0,7,8,9

DEPFREQ	How often do you feel depressed?	0 - NIU 1 - Daily 2 - Weekly 3 - Monthly 4 - A few times a year 5 - Never 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 1,2 1 = 3,4,5 Removed = 0,7,8,9
DEPRX	Do you take medication for depression?	0 - NIU 1 - No 2 - Yes 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 2 1 = 1 Removed = 0,7,8,9
DEPFEELEVL	Thinking about the last time you felt depressed, how depressed did you feel?	0 - NIU 1 - A little 2 - A lot 3 - Somewhere between little and lot 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	0 = 2,3 1 = 1 Removed = 0,7,8,9

Table 2. List of observed variables used to create healthcare proxy variable

Cryptic Variable	Survey Question	Original Code	Indicator Recode
USUALPL	Is there a place that you usually go to when you are sick or need advice about your health?	0 - NIU 1 - There is no place or No 2 - Yes, has a usual place or Yes 3 - There is more than one place 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	1 = 2,3 0 = 1 Removed = 0,7,8,9
DELAYCOST	Indicates whether, during the past twelve months, individuals delayed seeking medical care because of worry about the cost.	0 - NIU 1 - No 2 - Yes 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	1 = 1 0 = 2 Removed = 0,7,8,9

FAMYBARCAR	Reports if any family member needed but did not get medical care (due to cost) in the past 12 months.	1 - No 2 - Yes 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	1 = 1 0 = 2 Removed = 7,8,9
YBARCARE	Indicates whether, at any time during the past 12 months, individuals needed medical care but did not get it because they could not afford it.	1 - No 2 - Yes 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	1 = 1 0 = 2 Removed = 7,8,9
YBARMENTAL	Indicates whether, at any time during the past 12 months, sample adults and sample children needed mental health care or counseling but didn't get it because they couldn't afford it.	0 - NIU 1 - No 2 - Yes 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	1 = 1 0 = 2 Removed = 0,7,8,9
TRUBFINDRYR	During the past 12 months, did you have any trouble finding a general doctor or provider who would see you?	0 - NIU 1 - No 2 - Yes 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	1 = 1 0 = 2 Removed = 7,8,9
HCSATIS12M	In general, how satisfied are you with the health care you received in the past 12 months?	0 - NIU 1 - Very satisfied 2 - Somewhat satisfied 3 - Somewhat dissatisfied 4 - Very dissatisfied 5 - You haven't had health care in the past 12 months 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	1 = 1,2 0 = 3,4,5 Removed = 0,7,8,9
HINOTCOVE	Indicates whether the person currently lacks health insurance coverage.	0 - NIU 1 - No, has coverage 2 - Yes, has no coverage 7 - Unknown-refused 8 - Unknown-not ascertained 9 - Unknown-don't know	1 = 1 0 = 2 Removed = 0,7,8,9

Table 3. List of observed variables used to create career proxy variable

Cryptic Variable	Survey Question	Original Code	Indicator Recode
EMPSTAT	Reports whether persons were part of the labor force--working or seeking work--and, if so, whether they worked, had a job or business from which they were temporarily absent, or were looking for work or on layoff during the preceding two weeks	00 - NIU 10 - Working 11 - Working for pay at job/business 12 - Working, w/out pay, at job/business 20 - With job, but not at work 21 - With job, not at work: not laid-off, not looking 22 - With job, not at work: looking 30 - Unemployed 31 - Unemployed: On layoff 32 - Unemployed: On layoff and looking 33 - Unemployed: Unk if looking or laid off 34 - Unemployed: Looking or on layoff 35 - Unemployed: Have job to return to 36 - Unemployed: Had job during the round 37 - Unemployed: No job during reference period 40 - Not in labor force 90 - Unknown-all causes 97 - Unknown-refused 98 - Unknown-not ascertained 99 - Unknown-don't know	0 = 30,31,32,33,34,35,36,37 1 = 10,11,12,20,21,22 Removed = 00,40,90, 97,98,99
EDUC	What is the highest level of school you have completed or the highest degree you have received?	00 NIU 01 Never attended/kindergarten only 02 Grade 1 03 Grade 2 04 Grade 3 05 Grade 4 06 Grade 5	0 = 1- 16 1 = 17-22 Removed = 97, 98, 99

		07 Grade 6 08 Grade 7 09 Grade 8 10 Grade 9 11 Grade 10 12 Grade 11 13 12th grade, no diploma 14 High school graduate 15 GED or equivalent 16 Some college, no degree 17 AA degree: technical/vocational/occupational 18 AA degree: academic program 19 Bachelor's degree (BA, AB, BS, BBA) 20 Master's degree (MA, MS, Meng, Med, MBA) 21 Professional degree (MD, DDS, DVM, JD) 22 Doctoral degree (PhD, EdD) 97 Unknown--refused 98 Unknown--not ascertained 99 Unknown--don't know	